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2014-09-10
http://hdl.handle.net/10539/15494

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ABSTRACT

A Systematic Approach for Managing Design Changes on Global Collaborative Projects: A Case Study Analysis of Medupi Structural Steel

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The complexity of construction work means that it is hardly possible to complete a project without changes to the plans or the construction process. The complex construction projects are characterized by its schedule slip. Every project is liable to variations ranging from changes of the mind on the part of the client, or their consultant, to unforeseen problems raised by the main contractor or sub-contractor.

The effects of frequent changes in design include difficulties in settling variation claims, disruption in the flow of production, dispute resolution and regrettably litigation which have their negative effects on the project's completion time and cost. To ameliorate these negative effects on the execution of global collaborative projects, there is the need to implement a functional and effective design change management system.

The effects of design changes on structural steel connection design, detailing and fabrication is conducted. Concrete works and other works are outside of the scope of this study. The research study is an applied research since its objective is to select and recommend the most appropriate design management tool or method, to solve an existing problem of a global collaborative project. The research involved collection of data from project managers, engineers, detailers and draftsmen involved in the design of the structural steel component of the project, therefore qualitative research was undertaken. The quota sampling method was chosen. The qualitative method consisted of a literature review and questionnaire. Relevant literature was reviewed in order to explore existing design management tools/methods.

A mathematical tool for analysis of the data collected through the questionnaire was required in order to increase the validity and integrity of the data. This tool allowed for an analysis into the level of agreement or concordance between the respondents due to the fact that they were all from the same organization. The coefficient of concordance provided a reliable tool for measuring agreement or concordance between ranks in a rank structure. This further scientifically ascertained the reliability of the respondents.

From the empirical and theoretical findings of the study, it was found that there is a need for a design management tool/method which would lead to less claims and disputes. It was found that global collaboration had a big impact on the magnitude of design changes. Through the research, a design management tool which most likely to manage design changes on global collaborative projects is determined.